



SEQUENCE LISTING

<110> Fader, Gary M.
Jung, Woosuk
McGonigle, Brian
Odell, Joan T.
Yu, Xiaodan

<120> Nucleic Acid Fragments Encoding Isoflavone Synthase

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<141> 2001-05-06

<150> PCT/US00/01,772

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<150> 60/117769

<151> 1999-01-27

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<151> 1999-07-20

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
      35             40             45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
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Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met Pro Thr
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Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
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Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
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Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
      115            120            125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
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Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
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Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp Val Thr
      165            170            175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
      180            185            190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
      195            200            205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys Tyr Leu
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Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
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 Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
 35 40 45
 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
 50 55 60
 Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
 65 70 75 80

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Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu		
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225					230					235					240		
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Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu		
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<212> DNA
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22

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35 40 45
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Ser Phe Gly Ser Met
50 55 60

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Tyr	Trp	Arg	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125	
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Val	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175	
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Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200	205	
Tyr	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220	
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Gly	Ile	225	230	235	240
Val	Arg	Arg	Arg	Glu	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	245	250	255	
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Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300	
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Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	355	360	365	
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Val	Leu	Phe	Asn	Val	Trp	370	375	380	

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 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 17
 <211> 1501
 <212> DNA
 <213> *Vicia villosa*

<400> 17
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<210> 18
 <211> 499

<212> PRT

<213> Vicia villosa

<400> 18

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Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	
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Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	
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Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Leu	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	
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Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	
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Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	
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Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	
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				165					170					175		
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			180					185					190			
Lys	Ile	Tyr	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	
		195					200					205				
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		210				215					220					
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Val	Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Thr	Glu	
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 405 410 415
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 420 425 430
 Gly Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
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Ala Arg Ile

<210> 19

<211> 1501

<212> DNA

<213> Lens culinaris

<400> 19

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<210> 20

<211> 499

<212> PRT

<213> *Lens culinaris*

<400> 20

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His Pro His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
      35             40             45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
      50             55             60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
      65             70             75             80

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
      85             90             95

Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
      100            105            110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
      115            120            125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
      130            135            140

Phe Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp
      145            150            155            160

Val Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
      165            170            175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
      180            185            190

Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
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Tyr Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
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 Ile Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe
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 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
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 Glu Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val
 305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Ile Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
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 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
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 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
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 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
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 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
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Ala Arg Ile

<210> 21

<211> 1501

<212> DNA

<213> Lens culinaris

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<210> 22
<211> 499
<212> PRT
<213> Lens culinaris

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35 40 45
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
50 55 60
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
65 70 75 80
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
85 90 95
Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
100 105 110
Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
115 120 125
Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
130 135 140

Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155	160
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170		175
Val	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	180	185		190
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200		205
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215		220
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Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	275	280		285
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300	
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	305	310	315	320
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330		335
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Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	355	360	365	
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Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	385	390	395	400
Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	405	410		415
Asp	Leu	Arg	Gly	Arg	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	420	425		430
Arg	Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	435	440		445
Leu	Ala	Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	450	455	460	

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Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
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Ala Arg Ile

<210> 23

<211> 1566

<212> DNA

<213> Phaseolus aureus

<400> 23

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<210> 24

<211> 522

<212> PRT

<213> Phaseolus aureus

<400> 24

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      20           25           30

Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
      35           40           45

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Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	245	250	255	
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	260	265	270	
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys	275	280	285	
Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala	290	295	300	
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu	305	310	315	320
Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Ala	Tyr	Ser	325	330	335	
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	340	345	350	
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	355	360	365	

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 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
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 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
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 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
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 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
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 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
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 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
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 <213> Phaseolus aureus

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<211> 521

<212> PRT

<213> Phaseolus aureus

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Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His	Leu	35	40	45	
His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	Leu	Ser	50	55	60	
Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	Pro	Thr	65	70	75	80
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	85	90	95	
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	100	105	110	
Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	115	120	125	
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	130	135	140	
Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	145	150	155	160
Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Leu	Thr	165	170	175	
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	180	185	190	
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	195	200	205	
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	210	215	220	
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	225	230	235	240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	245	250	255	
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	260	265	270	

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 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
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<210> 27

<211> 1566

<212> DNA

<213> *Phaseolus aureus*

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<212> PRT

<213> Phaseolus aureus

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
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His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
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Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
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Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
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Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
      100                     105                     110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
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Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
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Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
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			180					185					190			
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Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	
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Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	
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Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp	Gln	Val	
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Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp	Leu	
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Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg	Met	
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Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Met	Ala	Thr	Leu	Leu	Ala	
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Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly	Gln	
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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
50 55 60

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Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr	His	
				85					90					95		
Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg	Arg	
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Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	
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Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	
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Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His	Leu	
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Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val	Phe	
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Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys	
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 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
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 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
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 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
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 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
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 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
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tcttaa

1566

<210> 32

<211> 521

<212> PRT

<213> *Trifolium pratense*

<400> 32

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Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
35 40 45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
50 55 60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
65 70 75 80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
85 90 95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
100 105 110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Ile Gly Pro Tyr Trp
115 120 125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
130 135 140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
145 150 155 160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr
165 170 175

Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
180 185 190

Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
195 200 205

Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu
210 215 220

Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
225 230 235 240

Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
245 250 255

Arg Arg Lys Asn Gly Glu Val Asp Glu Gly Glu Val Ser Gly Val Phe
260 265 270

Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys
 275 280 285
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
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 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
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<210> 33

<211> 1566

<212> DNA

<213> *Trifolium pratense*

<400> 33

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cgtcttcct	tcataggaca	ccttcacatc	ttaaaagaca	aacttctcca	ctacgcactc	180
atcgacctct	ccaaaaaaca	tggtccctta	ttctctctct	actttggctc	catgccaaacc	240
gttggtgcct	ccacaccaga	attgttcaag	ctcttcctcc	aaacgcacga	ggcaacttcc	300
ttcaacacaa	ggttcacaaac	ctcagccata	agacgcctca	cctatgatag	ctcagtggtcc	360

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tcttaa 1566

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<210> 34

<211> 521

<212> PRT

<213> *Trifolium pratense*

<400> 34

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Met Leu Leu Glu Leu Ala Leu Gly Leu Leu Val Leu Ala Leu Phe Leu
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His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg His Leu
      20                      25          30

Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
      35                      40          45

His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
      50                      55          60

Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met Pro Thr
      65                      70          75          80

Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr His
      85                      90          95

Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg Arg
      100                     105          110

Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr Trp
      115                     120          125

Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala Thr Thr
      130                     135          140

Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys Phe Leu
      145                     150          155          160

Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp Leu Thr
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Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met Met Leu
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 Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu Lys Ile
 195 200 205
 Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys His Leu
 210 215 220
 Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn Lys Phe
 225 230 235 240
 Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile Val Arg
 245 250 255
 Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly Val Phe
 260 265 270
 Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu Ile Lys
 275 280 285
 Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe Ser Ala
 290 295 300
 Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala Glu Leu
 305 310 315 320
 Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val Tyr Ser
 325 330 335
 Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn Leu
 340 345 350
 Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro Pro
 355 360 365
 Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn Gly
 370 375 380
 Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp Gln Val
 385 390 395 400
 Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495

Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg
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Ile Gly Val Ala Ser Lys Leu Leu Ser
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<210> 35
<211> 1563
<212> DNA
<213> Pisum sativum

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<210> 36
<211> 521
<212> PRT
<213> Pisum sativum

<400> 36
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20 25 30
Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His Leu
35 40 45
His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu Ser
50 55 60

Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Ser	Phe	Gly	Ser	Met	Pro	Thr	
65					70					75					80	
Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Ala	His	
				85					90					95		
Glu	Ala	Thr	Ser	Phe	Ser	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Val	Arg	Arg	
			100					105					110			
Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr	Trp	
		115					120					125				
Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr	
	130					135					140					
Val	Asn	Glu	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe	Leu	
145					150					155					160	
Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Val	Thr	
				165					170					175		
Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met	Leu	
			180					185					190			
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile	
		195					200					205				
Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	Tyr	Leu	
	210					215					220					
Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe	
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Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val	Arg	
				245					250					255		
Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	Val	Phe	
			260					265					270			
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile	Lys	
		275					280					285				
Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser	Ala	
	290					295					300					
Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu	Leu	
305					310					315					320	
Ile	Asn	Asn	Pro	Arg	Val	Leu	Gln	Lys	Ala	Arg	Glu	Glu	Val	Tyr	Ser	
				325					330					335		
Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu	
			340					345					350			
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro	
		355					360					365				
Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn	Gly	
	370					375					380					

Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln Val
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 Gly Lys Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg Pro Glu
 405 410 415
 Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp Leu
 420 425 430
 Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg Met
 435 440 445
 Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu Leu Ala
 450 455 460
 Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln
 465 470 475 480
 Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly
 485 490 495
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 515 520

<210> 37
 <211> 1496
 <212> DNA
 <213> Trifolium repens

<400> 37
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<210> 38
 <211> 498
 <212> PRT
 <213> Trifolium repens

<400> 38

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Leu	Pro	Asn	Pro	Pro	Ser	Pro	Arg	Pro	Arg	Leu	Pro	Phe	Ile	Gly	His
			20					25					30		
Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Pro	Ile	Asp	Leu
	35						40					45			
Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Ser	Phe	Gly	Ser	Met	Pro
	50					55					60				
Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	Thr
65					70					75					80
His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	Arg
				85					90					95	
His	Leu	Thr	Tyr	Asp	Asn	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro	Tyr
			100					105					110		
Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr
		115					120					125			
Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe
	130					135					140				
Leu	Arg	Val	Met	Ala	Gln	Ser	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	Val
145					150					155					160
Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	Met
				165					170					175	
Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys
			180					185					190		
Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	Tyr
		195					200					205			
Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys
	210					215					220				
Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val
225					230					235					240
Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Ala	Ser	Gly	Val
				245					250					255	
Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile
			260					265					270		
Lys	Ile	Thr	Lys	Glu	Gln	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser
		275					280					285			

Ala Gly Thr Asp Ser Thr Ala Val Val Thr Glu Trp Ala Leu Ala Glu
290 295 300

Leu Ile Asn Asn Pro Arg Val Leu Gln Lys Ala Arg Glu Glu Val Tyr
305 310 315 320

Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln Asn
325 330 335

Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His Pro
340 345 350

Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile Asn
355 360 365

Gly Tyr Val Ile Pro Glu Gly Ala Leu Val Leu Phe Asn Val Trp Gln
370 375 380

Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Ser Arg Pro
385 390 395 400

Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu Asp
405 410 415

Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Arg
420 425 430

Met Cys Pro Gly Val Ser Leu Ala Thr Ser Gly Met Ala Thr Leu Leu
435 440 445

Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly
450 455 460

Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg Ala
465 470 475 480

Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala
485 490 495

Arg Ile

<210> 39

<211> 1501

<212> DNA

<213> *Trifolium repens*

<400> 39

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cctacgacaa	ctctgtggcc	atgggttccat	tcggacctta	ctggaagtgc	gtgaggaagc	360
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<210> 40

<211> 499

<212> PRT

<213> *Trifolium repens*

<400> 40

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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
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His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
      35                40                45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
      50                55                60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
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Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
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Arg Arg Leu Thr Tyr Asp Asn Ser Val Ala Met Val Pro Phe Gly Pro
      100                105                110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
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Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
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Phe Leu Arg Val Met Ala Gln Ser Ala Glu Ala Gln Lys Pro Leu Asp
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Val Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
      165                170                175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
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Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
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Tyr Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
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 225 230 235 240
 Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Ala Ser Gly
 245 250 255
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Met Glu
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 Ile Lys Ile Thr Lys Glu Gln Ile Lys Gly Leu Val Val Asp Phe Phe
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 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
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 Glu Leu Ile Asn Asn Pro Lys Val Leu Gln Lys Ala Arg Glu Glu Ala
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 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
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 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Gly Ile
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 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Gly Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Asp Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495
 Ala Arg Ile

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<213> Artificial Sequence

<220>

<223> PCR primer

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<210> 42
 <211> 32
 <212> DNA
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 42
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<210> 43
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 <212> DNA
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 43
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<210> 44
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 44
 cctctcggga cggaattctg atggt 25

<210> 45
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 <212> DNA
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 45
 gcggtgcacg ggcggactct tcttc 25

<210> 46
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>

<223> PCR primer

<400> 46
cgcccaatac gcaaaccgcc tctcc

25

<210> 47
<211> 1501
<212> DNA
<213> Beta vulgaris

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g 1501

<210> 48
<211> 499
<212> PRT
<213> Beta vulgaris

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His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
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His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
35 40 45
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
50 55 60
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
65 70 75 80
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
85 90 95

Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Met	Val	Pro	Phe	Gly	Pro		
			100					105						110			
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala		
		115					120					125					
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys		
		130				135					140						
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp		
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				165					170					175			
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Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys		
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His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn		
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Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile		
225					230					235					240		
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Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe		
		275					280					285					
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala		
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Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val		
305					310					315					320		
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln		
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Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His		
		340						345					350				
Pro	Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Ile	Glu	Glu	Cys	Glu	Ile		
		355					360					365					
Asn	Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Leu	Phe	Asn	Val	Trp		
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Gln	Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg		
385					390					395					400		
Pro	Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Leu	Leu		
			405						410					415			

Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
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 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
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 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
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 485 490 495

Ala Arg Ile

<210> 49
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 <212> DNA
 <213> Artificial Sequence

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<400> 50
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<210> 51
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<400> 51
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<220>
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 <222> (895)..(1112)

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<210> 53
<211> 1900
<212> DNA
<213> Glycine max

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<220>
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<222> (947)..(1082)

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<210> 54

<211> 1501

<212> DNA

<213> Lupinus albus

<400> 54

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agtgggcatt	ggcagaactc	atcaacaatc	ctaaggtgtt	ggaaagggtc	cgtgaggagg	960
tctacagtgt	tgtgggaaag	gacagacttg	tggacgaagt	tgacactcaa	aaccttccct	1020
acattagagc	aatcgtgaag	gagacattcc	gcatgcaccc	gccactccca	gtgggtcaaaa	1080
gaaagtgcac	agaagagtgt	gagattaatg	gatatgtgat	cccagaggga	gcattgattc	1140
tcttcaatgt	atggcaagta	ggaagagacc	ccaaatactg	ggacagacca	tccgagttcc	1200
gtcctgagag	gttcctagag	acagaggctg	aagggggaagc	aaggcctctt	gatcttaggg	1260
gacaacattt	tcaacttctc	ccatttgggt	ctgggaggag	aatgtgccct	ggagtcattc	1320
tggctacttc	gggaatggca	acacttcttg	catctcttat	tcagtgcctt	gacttgcaag	1380
tgctgggtcc	acaaggacag	atattgaagg	gtgggtgacgc	caaagttagc	atggaagaga	1440
gagccggcct	cactgttcca	agggcacata	gtcttgtctg	tgttccactt	gcaaggatcg	1500
g						1501

<210> 55

<211> 499

<212> PRT

<213> Lupinus albus

<400> 49

Phe	Leu	His	Leu	Arg	Pro	Thr	Pro	Thr	Ala	Lys	Ser	Lys	Ala	Leu	Arg
1				5					10					15	

His	Leu	Pro	Asn	Pro	Pro	Ser	Pro	Lys	Pro	Arg	Leu	Pro	Phe	Ile	Gly
			20					25					30		

His	Leu	His	Leu	Leu	Lys	Asp	Lys	Leu	Leu	His	Tyr	Ala	Leu	Ile	Asp	35	40	45
Leu	Ser	Lys	Lys	His	Gly	Pro	Leu	Phe	Ser	Leu	Tyr	Phe	Gly	Ser	Met	50	55	60
Pro	Thr	Val	Val	Ala	Ser	Thr	Pro	Glu	Leu	Phe	Lys	Leu	Phe	Leu	Gln	65	70	75
Thr	His	Glu	Ala	Thr	Ser	Phe	Asn	Thr	Arg	Phe	Gln	Thr	Ser	Ala	Ile	85	90	95
Arg	Arg	Leu	Thr	Tyr	Asp	Ser	Ser	Val	Ala	Arg	Val	Pro	Phe	Gly	Pro	100	105	110
Tyr	Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	115	120	125
Thr	Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	130	135	140
Phe	Leu	Arg	Val	Met	Ala	Gln	Gly	Ala	Glu	Ala	Gln	Lys	Pro	Leu	Asp	145	150	155
Leu	Thr	Glu	Glu	Leu	Leu	Lys	Trp	Thr	Asn	Ser	Thr	Ile	Ser	Met	Met	165	170	175
Met	Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	180	185	190
Lys	Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	195	200	205
His	Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	210	215	220
Lys	Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	225	230	235
Val	Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	245	250	255
Val	Leu	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	260	265	270
Ile	Lys	Ile	Thr	Lys	Asp	His	Ile	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	275	280	285
Ser	Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	290	295	300
Glu	Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Arg	Ala	Arg	Glu	Glu	Val	305	310	315
Tyr	Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	325	330	335
Asn	Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	340	345	350

Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Glu Ala Glu Gly Glu Ala Arg Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Ile Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495

Ala Arg Ile

<210> 56

<211> 1501

<212> DNA

<213> *Medicago sativa*

<400> 56

tgtttctgca cttgcgtccc acacccactg caaaatcaaa agcacttcgc catctcccaa 60
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 aactttctcca ctacgcactc atcgacctct ccaaaaaaca tgggtccctta ttctctctct 180
 acttttggtc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttccttc 240
 aaacgcacga ggcaacttcc ttcaacacaa ggttcctaac ctcagccata agacgcctca 300
 cctatgatag ctacgtggcc atggctccct tcggacctta ctggaagttc gtgaggaagc 360
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaca gttgaggcct ttgaggacct 420
 aacagatccg caagttcctt aggggttatg cccaaggcgc agaggcacag aagccccttg 480
 acttgaccga ggagcttctg aaatggacca acagcaccac ctccatgatg atgctcggcg 540
 aggctgagga gatcagagac atcgcccgcg aggttcttaa gatctttggc gaatacagcc 600
 tcaactgact catccggcca ttgaagcatc tcaaggttgg aaagtatgag aagaggatcg 660
 acgacatctt gaacaagtcc gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga 720
 tcgtgaggag gagaaagaac ggagagggtt ttgagggtga ggtcagcggg gttttccttg 780
 acactttgct tgaattcgct gaggatgaga ccacggagat caaaatcacc aaggaccaca 840
 tcaagggctt tgttgtcgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900
 agtgggcatt ggcagaactc atcaacaatc ctaaggtgtt ggaaaaggct cgtgaggagg 960
 tctacagtgt tgtgggaaag gacagacttg tggacgaagt tgacactcaa aaccttcctt 1020
 acattagagc aatcgtgaag gagacattcc gcatgcaccc gccactccca gtggtcaaaa 1080
 gaaagtgcac agaagagtgt gagattaatg gatattgtgat cccagaggga gcattgattc 1140
 tcttcaatgt atggcaagta ggaagagact ccaaatactg ggacagacca tcggagttcc 1200
 gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcctctt gatcttaggg 1260
 gacaacattt tcaacttctc ccatttgggt ctgggaggag aatgtgccct ggagtcaatc 1320
 tggctacttc gggaatggca acacttcttg catctcttat tcagtgtttt gacttgcaag 1380
 tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440

gggccggcct cactgttcca agggcacata gtcttgtctg tgttccactt gcaaggatcg 1500
g 1501

<210> 57
<211> 499
<212> PRT
<213> Medicago sativa

<400> 57
Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
1 5 10 15
His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
20 25 30
His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
35 40 45
Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
50 55 60
Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
65 70 75 80
Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
85 90 95
Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Ala Pro Phe Gly Pro
100 105 110
Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
115 120 125
Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
130 135 140
Phe Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
145 150 155 160
Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Thr Ser Met Met
165 170 175
Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
180 185 190
Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Arg Pro Leu Lys
195 200 205
His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
210 215 220
Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile
225 230 235 240
Val Arg Arg Arg Lys Asn Gly Glu Val Val Glu Gly Glu Val Ser Gly
245 250 255
Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu
260 265 270

Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe
 275 280 285
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
 290 295 300
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val
 305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
 340 345 350
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Ser Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495
 Ala Arg Ile

<210> 58
 <211> 1501
 <212> DNA
 <213> *Medicago sativa*

<400> 58
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 accaccaag cccaaagcct cgtcttccct tcataggaca ccttcatctc ttaaaagaca 120
 aacttctcca ctacgcactc atcgacctct ccaaaaaaca tggtcctta ttctctctct 180
 actttggctc catgccaacc gttgttgctt ccacaccaga attgttcaag ctcttcctcc 240
 aaacgcacga ggcaacttcc ttcaacacaa ggttccaaac ctcagccata agacgcctca 300
 cctatgatag ctcaagtggc atgggtccct tcggacctta ctggaagttc gtgaggaagc 360
 tcatcatgaa cgaccttctc aacgccacca ctgtaaaciaa gttgaggcct ttgaggaccc 420
 aacagatccg caagctcctt aggggttatgg cccaaggcgc agaggcacag aagccccttg 480

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acttgaccga ggagcttctg aaatggacca acagcaccat ctccatgatg atgctcggcg 540
aggctgagga gatcagagac atcgctcgcg aggttcttaa gatctttggc gaatacagcc 600
tactgactt catctggcca ttgaagcatc tcaagggttg aaagtatgag aagaggatcg 660
acgacatctt gaacaagttc gaccctgtcg ttgaaagagt catcaagaag cgccgtgaga 720
tcgtgaggag gagaaagaac ggagagggtta ttgaggggtga ggtcagcggg gttttccttg 780
acactttgct tgaattcgct gaggatgaga ccacggagat caaatcacc aaggaccaca 840
tcaagggctt tgttgctgac tttttctcgg caggaacaga ctccacagcg gtggcaacag 900
agtgggcatt ggcagaactc atcaacaatc ctaagggtgt ggagaaggct cgtgaggagg 960
tctacagtgt tgtgggaaag gacagacttg tggacgaagt tgacactcaa aaccttcctt 1020
acattagagc aatcgtgaag gagacattcc gcatgcaccc gccactccca gtggtcaaaa 1080
gaaagtgcac agaagagtgt gagattaatg gatatgtgat cccagaggga gcattgatc 1140
tcttcaatgt atggcaagta ggaagagacc ccaaatactg ggacagacca tcggagttcc 1200
gtcctgagag gttcctagag acaggggctg aaggggaagc aaggcctctt gatcttaggg 1260
gacaacattt tcaacttctc ccatttgggt ctgggaggag aatgtgccct ggagtcaatc 1320
tggctacttc gggaatggca acacttcttg catctcttat tcagtgtctt gacttgcaag 1380
tgctgggtcc acaaggacag atattgaagg gtggtgacgc caaagttagc atggaagaga 1440
ggccggcct cactgttcca agggcacata gtctgtctg tgttcactt gcaaggatcg 1500
g

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<210> 59

<211> 499

<212> PRT

<213> *Medicago sativa*

<400> 59

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Phe Leu His Leu Arg Pro Thr Pro Thr Ala Lys Ser Lys Ala Leu Arg
  1                      5                      10                      15

His Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly
          20                      25                      30

His Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp
          35                      40                      45

Leu Ser Lys Lys His Gly Pro Leu Phe Ser Leu Tyr Phe Gly Ser Met
          50                      55                      60

Pro Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln
          65                      70                      75                      80

Thr His Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile
          85                      90                      95

Arg Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro
          100                     105                     110

Tyr Trp Lys Phe Val Arg Lys Leu Ile Met Asn Asp Leu Leu Asn Ala
          115                     120                     125

Thr Thr Val Asn Lys Leu Arg Pro Leu Arg Thr Gln Gln Ile Arg Lys
          130                     135                     140

Leu Leu Arg Val Met Ala Gln Gly Ala Glu Ala Gln Lys Pro Leu Asp
          145                     150                     155                     160

Leu Thr Glu Glu Leu Leu Lys Trp Thr Asn Ser Thr Ile Ser Met Met
          165                     170                     175

Met Leu Gly Glu Ala Glu Glu Ile Arg Asp Ile Ala Arg Glu Val Leu
          180                     185                     190

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Lys Ile Phe Gly Glu Tyr Ser Leu Thr Asp Phe Ile Trp Pro Leu Lys
 195 200 205
 His Leu Lys Val Gly Lys Tyr Glu Lys Arg Ile Asp Asp Ile Leu Asn
 210 215 220
 Lys Phe Asp Pro Val Val Glu Arg Val Ile Lys Lys Arg Arg Glu Ile
 225 230 235 240
 Val Arg Arg Arg Lys Asn Gly Glu Val Ile Glu Gly Glu Val Ser Gly
 245 250 255
 Val Phe Leu Asp Thr Leu Leu Glu Phe Ala Glu Asp Glu Thr Thr Glu
 260 265 270
 Ile Lys Ile Thr Lys Asp His Ile Lys Gly Leu Val Val Asp Phe Phe
 275 280 285
 Ser Ala Gly Thr Asp Ser Thr Ala Val Ala Thr Glu Trp Ala Leu Ala
 290 295 300
 Glu Leu Ile Asn Asn Pro Lys Val Leu Glu Lys Ala Arg Glu Glu Val
 305 310 315 320
 Tyr Ser Val Val Gly Lys Asp Arg Leu Val Asp Glu Val Asp Thr Gln
 325 330 335
 Asn Leu Pro Tyr Ile Arg Ala Ile Val Lys Glu Thr Phe Arg Met His
 340 345 350
 Pro Pro Leu Pro Val Val Lys Arg Lys Cys Thr Glu Glu Cys Glu Ile
 355 360 365
 Asn Gly Tyr Val Ile Pro Glu Gly Ala Leu Ile Leu Phe Asn Val Trp
 370 375 380
 Gln Val Gly Arg Asp Pro Lys Tyr Trp Asp Arg Pro Ser Glu Phe Arg
 385 390 395 400
 Pro Glu Arg Phe Leu Glu Thr Gly Ala Glu Gly Glu Ala Arg Pro Leu
 405 410 415
 Asp Leu Arg Gly Gln His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg
 420 425 430
 Arg Met Cys Pro Gly Val Asn Leu Ala Thr Ser Gly Met Ala Thr Leu
 435 440 445
 Leu Ala Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln
 450 455 460
 Gly Gln Ile Leu Lys Gly Gly Asp Ala Lys Val Ser Met Glu Glu Arg
 465 470 475 480
 Ala Gly Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu
 485 490 495
 Ala Arg Ile

<210> 60
 <211> 1497
 <212> DNA
 <213> Beta vulgaris

<400> 60
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 accaagccca aagcctcgtc ttcccttcat aggacacctt catctcttaa aagacaaact 120
 tctccactac gcactcatcg acctctccaa aaaacatggc cccttattct ctcactactt 180
 tggctccatg ccaaccgttg ttgcctccac accagaattg ttcaagctct tcctccaaac 240
 gaacgaggca acttccttca acacaagggt ccaaacctca gccataagac gcctcaccta 300
 tgatagctca gtggccatgg ttcccttcgg accttactgg aagttcgtga ggaagctcat 360
 catgaacgac cttctcaacg ccaccactgt aaacaagttg aggcctttga ggacccaaca 420
 gatccgcaag ttccttaggg ctatggccca aggcgcagag gcacggaagc cccttgactt 480
 gaccgaggag cttctgaaat gggccaacag caccatctcc atgatgatgc tcggcgaggc 540
 tgaggagatc agagacatcg ctgcgcagggt tcttaagatc tttggcgaat acagcctcac 600
 tgacttcacg tggccattga agcatctcaa ggttggaag tatgagaaga ggatcgacga 660
 catcttgaac aagttcgacc ctgtcggtga aagagtcac aagaagcgcc gtgagatcgt 720
 gaggaggaga aagaacggag aggttggtga gggtgaggtc agcggggtt tccttgacac 780
 tttgcttgaa ttcgtgagg atgagaccat ggagatcaaa atcaccaagg accacaccaa 840
 gggctctgtt gtcgacttct tctcggcagg aacagactcc acagcgggtg caacagagt 900
 ggcattggca gaactcatca acaatcctaa ggtgttgga aaggctcgtg aggaggtcta 960
 cagtgttggt ggaaaggaca gacttggtga cgaagttgac actcaaaacc ttccttacat 1020
 tagagcaatc gtgaaggaga cattccgcac gcacccgcca ctcccagtgg tcaaaagaaa 1080
 gtgcacagaa gagtgtgaga ttaatggata tgtgatccca gagggagcat tgattccctt 1140
 caatgtatgg caagtaggaa gagaccccaa atactgggac agaccatcgg agttccgtcc 1200
 tgagagggtc ctagagacag gggctgaagg ggaagcaagg cctcttgatc ttaggggaca 1260
 acatthtcaa cttctcccat ttgggtcttg gaggagaatg tgccctggag tcaatctggc 1320
 tacttcggga acggcaacac ttcttgcatc tcttattcag tgctttgact tgcaagtgtc 1380
 gggccacag ggacagatat tgaagggtg tgacgcaaaa gtagcatgg aagagagagc 1440
 cggcctcact gttccaaggg cacatagtct tgtctgtgtt ccacttgcaa ggatcgg 1497

<210> 61
 <211> 498
 <212> PRT
 <213> Beta vulgaris

<400> 61
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 Leu Pro Asn Pro Pro Ser Pro Lys Pro Arg Leu Pro Phe Ile Gly His
 20 25 30
 Leu His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Leu Ile Asp Leu
 35 40 45
 Ser Lys Lys His Gly Pro Leu Phe Ser His Tyr Phe Gly Ser Met Pro
 50 55 60
 Thr Val Val Ala Ser Thr Pro Glu Leu Phe Lys Leu Phe Leu Gln Thr
 65 70 75 80
 Asn Glu Ala Thr Ser Phe Asn Thr Arg Phe Gln Thr Ser Ala Ile Arg
 85 90 95
 Arg Leu Thr Tyr Asp Ser Ser Val Ala Met Val Pro Phe Gly Pro Tyr
 100 105 110

Trp	Lys	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr		
		115					120					125					
Thr	Val	Asn	Lys	Leu	Arg	Pro	Leu	Arg	Thr	Gln	Gln	Ile	Arg	Lys	Phe		
	130					135					140						
Leu	Arg	Ala	Met	Ala	Gln	Gly	Ala	Glu	Ala	Arg	Lys	Pro	Leu	Asp	Leu		
145					150					155					160		
Thr	Glu	Glu	Leu	Leu	Lys	Trp	Ala	Asn	Ser	Thr	Ile	Ser	Met	Met	Met		
				165					170					175			
Leu	Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys		
			180					185					190				
Ile	Phe	Gly	Glu	Tyr	Ser	Leu	Thr	Asp	Phe	Ile	Trp	Pro	Leu	Lys	His		
	195						200					205					
Leu	Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys		
	210					215					220						
Phe	Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Glu	Ile	Val		
225					230					235					240		
Arg	Arg	Arg	Lys	Asn	Gly	Glu	Val	Val	Glu	Gly	Glu	Val	Ser	Gly	Val		
				245					250					255			
Phe	Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Met	Glu	Ile		
			260					265					270				
Lys	Ile	Thr	Lys	Asp	His	Thr	Lys	Gly	Leu	Val	Val	Asp	Phe	Phe	Ser		
	275						280					285					
Ala	Gly	Thr	Asp	Ser	Thr	Ala	Val	Ala	Thr	Glu	Trp	Ala	Leu	Ala	Glu		
	290					295					300						
Leu	Ile	Asn	Asn	Pro	Lys	Val	Leu	Glu	Lys	Ala	Arg	Glu	Glu	Val	Tyr		
305					310					315					320		
Ser	Val	Val	Gly	Lys	Asp	Arg	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn		
				325					330					335			
Leu	Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro		
			340					345					350				
Pro	Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Thr	Glu	Glu	Cys	Glu	Ile	Asn		
		355					360					365					
Gly	Tyr	Val	Ile	Pro	Glu	Gly	Ala	Leu	Ile	Pro	Phe	Asn	Val	Trp	Gln		
	370					375					380						
Val	Gly	Arg	Asp	Pro	Lys	Tyr	Trp	Asp	Arg	Pro	Ser	Glu	Phe	Arg	Pro		
385					390					395					400		
Glu	Arg	Phe	Leu	Glu	Thr	Gly	Ala	Glu	Gly	Glu	Ala	Arg	Pro	Leu	Asp		
				405					410					415			
Leu	Arg	Gly	Gln	His	Phe	Gln	Leu	Leu	Pro	Phe	Gly	Ser	Gly	Arg	Arg		
			420					425					430				

Met	Cys	Pro	Gly	Val	Asn	Leu	Ala	Thr	Ser	Gly	Thr	Ala	Thr	Leu	Leu
		435					440					445			
Ala	Ser	Leu	Ile	Gln	Cys	Phe	Asp	Leu	Gln	Val	Leu	Gly	Pro	Gln	Gly
		450				455					460				
Gln	Ile	Leu	Lys	Gly	Gly	Asp	Ala	Lys	Val	Ser	Met	Glu	Glu	Arg	Ala
465					470					475					480
Gly	Leu	Thr	Val	Pro	Arg	Ala	His	Ser	Leu	Val	Cys	Val	Pro	Leu	Ala
				485					490					495	

Arg Ile

<210> 62
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR PRIMER

<400> 62
 gttaccatgg ctgctgctat tg 22

<210> 63
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR PRIMER

<400> 63
 ttaaacgtaa aatgaaacaa gagg 24

<210> 64
 <211> 26
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR PRIMER

<400> 64
 gacacttcga cactgctgct gcttat 26

<210> 65
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
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 Pro Asn Pro Pro Ser Pro Xaa Pro Arg Leu Pro Phe Ile Gly His Xaa
 35 40 45

 His Leu Leu Lys Asp Lys Leu Leu His Tyr Ala Xaa Ile Asp Leu Ser
 50 55 60

 Lys Lys His Gly Pro Leu Phe Ser Xaa Xaa Phe Gly Ser Met Pro Thr

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Leu	Thr	Tyr	Asp	Xaa	Xaa	Val	Ala	Xaa	Xaa	Pro	Xaa	Gly	Pro	Tyr	Trp
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Xaa	Phe	Val	Arg	Lys	Leu	Ile	Met	Asn	Asp	Leu	Leu	Asn	Ala	Thr	Thr
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			180					185					190		
Gly	Glu	Ala	Glu	Glu	Ile	Arg	Asp	Ile	Ala	Arg	Glu	Val	Leu	Lys	Ile
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Lys	Val	Gly	Lys	Tyr	Glu	Lys	Arg	Ile	Asp	Asp	Ile	Leu	Asn	Lys	Phe
225					230					235					240
Asp	Pro	Val	Val	Glu	Arg	Val	Ile	Lys	Lys	Arg	Arg	Xaa	Ile	Val	Arg
				245					250					255	
Arg	Arg	Xaa	Asn	Gly	Glu	Xaa	Xaa	Glu	Gly	Glu	Xaa	Ser	Gly	Val	Xaa
			260					265					270		
Leu	Asp	Thr	Leu	Leu	Glu	Phe	Ala	Glu	Asp	Glu	Thr	Xaa	Glu	Ile	Lys
		275					280					285			
Ile	Thr	Lys	Xaa	Xaa	Xaa	Lys	Gly	Leu	Val	Val	Asp	Xaa	Phe	Ser	Ala
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Ile	Asn	Asn	Pro	Xaa	Val	Leu	Xaa	Xaa	Ala	Arg	Glu	Glu	Xaa	Tyr	Ser
				325					330					335	
Val	Val	Gly	Lys	Asp	Xaa	Leu	Val	Asp	Glu	Val	Asp	Thr	Gln	Asn	Leu
			340					345					350		
Pro	Tyr	Ile	Arg	Ala	Ile	Val	Lys	Glu	Thr	Phe	Arg	Met	His	Pro	Pro
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Leu	Pro	Val	Val	Lys	Arg	Lys	Cys	Xaa	Glu	Glu	Cys	Xaa	Ile	Asn	Gly
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Xaa	Val	Xaa	Pro	Glu	Gly	Ala	Leu	Xaa	Xaa	Phe	Asn	Val	Trp	Gln	Val

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Arg Phe Leu Glu Thr Xaa Ala Glu Gly Glu Ala Xaa Xaa Leu Asp Leu						
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Arg Gly Xaa His Phe Gln Leu Leu Pro Phe Gly Ser Gly Arg Xaa Met						
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Cys Pro Gly Val Xaa Leu Ala Thr Ser Gly Xaa Ala Thr Leu Leu Ala						
	450			455		460
Ser Leu Ile Gln Cys Phe Asp Leu Gln Val Leu Gly Pro Gln Gly Gln						
465		470		475		480
Ile Leu Lys Gly Xaa Asp Ala Lys Val Ser Met Glu Glu Arg Ala Gly						
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Leu Thr Val Pro Arg Ala His Ser Leu Val Cys Val Pro Leu Ala Arg						
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Ile Gly Val Ala Ser Lys Leu Leu Ser						
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